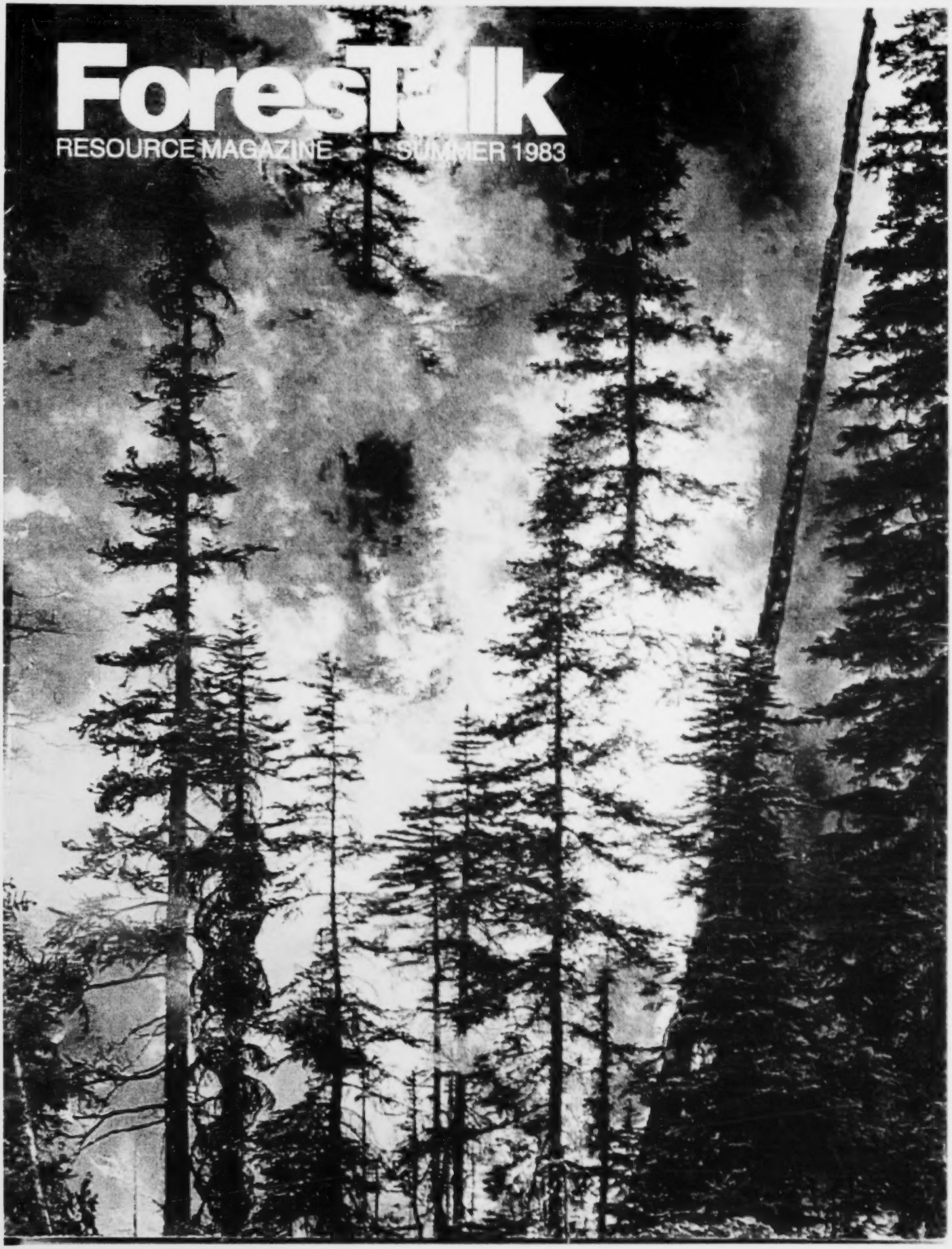
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Cover: The Forest Service handles an average of 2500 forest fires a year, 90 percent of which are brought under control within 24 hours of being reported. But each year a few major fires keep firefighters busy for months.

The cover photo by veteran Forest Service photographer R.J. Challenger was taken at the 1983 SWISS fire south of Houston, where over 18,000 hectares of spruce and pine forests went up in flames in late May and June. Of the 3.5 million cubic metres of timber affected, 2 million cubic metres of still usable wood will be harvested by June of next year.

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Recently the U.S. Commerce Department made its final ruling because Canadian lumber imported by the U.S. is not subsidized by federal or provincial governments it therefore does not compete unfairly with U.S. lumber and will not be charged an import duty.

Any countervailing duty on Canadian lumber would have struck hard at the B.C. forest economy.

It took a lot of work by government and industry to avoid the threat of countervailing duties, and I believe we have managed to convince a lot of people in the U.S. of one big, basic truth: the U.S. needs Canadian lumber, and free and fair trade in lumber is as much to their benefit as to ours.

Hon. Tom Waterland, *Minister of Forests*

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With its 1,227 campsites and over 2,600 kilometres of trails used by some 1,800,000 visitors a year, for the past decade the forest ministry's low-key recreation management program has had to cope with everything . . .

FROM BOTTLE CAPS TO WARS

by Gord Price

photography by Douglas Cowell

High noon on Highway 99. The summer sunshine bounces off the Tantalus glaciers across the Squamish River valley. Construction crews hold up traffic as they work on straightening the long and winding road to Whistler, a recreation area north of Vancouver best known for its winter skiing. The kenworth trucks and Winnebago RVs wait patiently. Only the lean, black-trunked cyclists on stripped-down 10-speeds show irritation: their private clocks ticking off the lost seconds. Finally everyone gets the go-ahead from the woman with the walkie-talkie.

"dispersed recreation," and dispersed recreation is the Forest Service's special interest.

"We don't build 'skookum' developments," notes Johnson's assistant, Nanci Lannan. "That's the job done by provincial parks. It's our job to provide rustic and less structured facilities for dispersed use recreation."

Still, Cal-Chek does have some polished qualities, due to the fact that it was built by a firefighting crew in need of a morale-boosting project during a long period of wet weather. And the crew leader happened to be an architecture student with a keen eye for detail. The site is treed, but open and airy; its thoughtful design carefully separates the tents from the cars; there's a hand-hewn alpine A-frame nestled in the woods that's a worthy addition to anyone's list of great outhouses; and right at the confluence of the two rivers, on the small point of land above, there's a bench that absolutely insists that you sit and contemplate the view.

But there's a problem here. Except for a lone camper outfitted with his dirt bike and kayak, no one appears to have used the site for quite a while.

It seems that most people from outside the region don't know the site exists, while it's too remote for casual use by the people of Squamish; they're more likely to be found at the Forest Service sites on Brohm and Cat Lakes, fishing, swimming and canoeing closer to home.

Rick Johnson isn't unaware of the irony. "This under-use is the flip side of our policy of not actively publicizing campsites. It's true that on a good summer evening, when there's an RV in every cubbyhole along the Whistler highway, the people would probably prefer to be in a campsite, but they don't know it's here."

About the only way for someone to find out about Forest Service campsites, or any other forest ministry recreation facility on Crown forestland, is to visit the closest Forest Service district office. There are 60 of them throughout the province. Recreation

The Cheakamus River below the road is icy blue where it meets Callaghan Creek. Ministry of Forests district recreation officer Rick Johnson turns off the highway to check out the Cal-Chek campsite. It is just one of 16 campsites maintained by the Forest Service in the Squamish-Pemberton Forest District, but one that he as recreation officer is especially proud of.

"It has all the elements of a good site: accessibility, features, size, future development potential, and water." He means more than just drinking water. He means fishing, swimming and canoeing water.

Sometimes it seems the definition of recreation is water, because moving about on water is what people seem to want most. But outdoor recreation is all forms of movement — hiking, climbing, snowmobiling, cross-country skiing. When people wander over the landscape in this way it's called

A Sad Tale But True

"It's one of our major problems, but people shy away from talking about it. In the Chilliwack District on a long weekend, it can cost a couple of thousand of dollars."

The problem? Vandalism. And according to Vancouver regional recreation officer Doug Herchmer, it's a problem the Ministry of Forests can't afford.

"Our program is a real set-up for problems. The sites are unsupervised and isolated. So outhouses are flattened and burned. Tabletops are ripped off, cut up and burned. In the fall, hunters shoot up sites. In the spring, grad parties are in full swing, with their accompanying vandalism.

"We've formed patrols with the RCMP, set up roadblocks and confiscated liquor. Up to a degree we've been successful, but there's such a cost in time and money. More than that, it's demoralizing and frustrating."

One solution to vandalism can be to restrict car access. Notes Squamish district recreation officer Rick Johnson: "At Cat Lake, after the Boy Scouts cleaned up the site, we put up a sign that appealed to people's better nature. They burned the sign. Then we put up a gate that required people to walk in for a kilometre. We braced ourselves for an onslaught of negative comment — but it was all good news. The townspeople felt that they could now use the site without fear of the rowdies who used to gather there for drinking parties."

The real solution, however, as suggested by Doug Herchmer is beyond the ability of the ministry to enforce: "People are going to have to take more responsibility and police themselves."

Lands managed by the Forest Service provide recreationists with access to a wide variety of outdoor experiences. These include hiking (right), kayaking (page 5), relaxing in a Sayward Forest camp site (page 4), or going on a nature walk (below).

With Howe Sound in the background (bottom), rock climber Nancy Larman, Forest Service recreation technician in Squamish, scales the towering granite face of Stawamus Chief.

information isn't advertised more broadly because the Forest Service isn't about to get into a popularity contest with the Parks Branch or private campsites. What it does want to do is provide basic facilities for recreationists in more remote areas or in more heavily used Crown forestland areas, to reduce some of the more unfortunate impacts of recreation such as litter, fire danger and poor sanitation.

The problem of Cat-Chek not being fully utilized is one the Forest Service knows will solve itself as the site becomes better known. The tougher problem is what to do once a spot *has* become popular.

Given the amount of traffic it carries, on some days it seems as if the Menzies mainline, the chief logging road through the Sayward Forest, is wider than the Vancouver Island Highway. The Sayward is well used by the people from neighbouring Campbell River and, increasingly, by people from all of Vancouver Island as the recreational virtues of this highly accessible, second-growth forest become known.

John Tisdale, the Forest Service recreation officer for the Campbell River district, reaches from his truck to pull off a crudely lettered cardboard sign that had been steering traffic to a favourite campsite. When he reaches the site the place is packed: campers and cars have spilled over into the picnic area. A boy runs up to Tisdale with a request for garbage bags; the boy's mother smiles and waves as John drives past.

"There's been a gradual increase in the use of sites because of greater awareness — usually through word of mouth," observes Tisdale. "But the economy has had a drastic impact

More people are looking for a cheap holiday near home. Occasionally people will move in a trailer, park it here for the summer, and visit it on weekends. This can contribute greatly to the kind of overcrowding you see here."

Because of overcrowding, it is Forest Service policy to ask people who have been camped in a recreation site for more than two weeks to move on.

(Below) Families especially make extensive use of Forest Service campsites located beside lakes and rivers. But given the growing trend for dispersed recreation (canoeing, hiking, cross-country skiing, etc.), the Forest Service is putting more work into developing recreation "concepts" such as the Sayward Forest canoe route (above), a 48-kilometre chain of low-level lakes accessible from many points.

"There's just too much emphasis on campsites," Kamill Apt says as he leans forward in his chair. "Sites are ancillary to real recreation management, but they become the focus of attention. They get the compliments and the criticisms. Managers begin to think of recreation management as campsite management: picking up the garbage, putting up signs." He pauses. "This site-centred philosophy is wrong."

Kamill Apt's office is in downtown Victoria, at the Ministry of Forests headquarters. Freed from the distractions and problems of maintaining campsites, his role as planning manager for the Recreation Management Branch allows him to take a broader perspective.

"Recreation management is part of forest management. There are recreation opportunities on almost every hectare of forestland, not just in the campsites and trails. We're trying to make all staff aware that when they make any kind of forestry decision, they're also making a recreation decision. The size and extent of a clearcut, the placement of a road, the access provided to a lake — all these are decisions that will affect the value of recreation in an area."

Kamill Apt sees the first phase of recreation management as "provision of opportunity. We provide access and protect values." This undoubtedly was the intention of the Forest Act which in 1978 recognized recreation management as one of the three main goals of the forest ministry, along with timber and range management.

In fact, the ministry's recreation management program started up five years before the new legislation came into effect. In those early days much of the time was spent developing what came to be known affectionately as "bottle-cap sites." These, according to Rick Johnson, were forest locations the Forest Service selected to make into campsites primarily on the basis of the number of bottle caps found lying on the ground — signs of informal but intensive use. There wasn't much site design involved: a garbage can here, an outhouse there.

The job of recreation management has become considerably more sophisticated since then, with planners relying on research and statistical sampling to show how changing trends in society affect recreation patterns. Vancouver regional recreation officer Doug Herchmer reports that overall there's more dispersed recreation — canoeing, hiking, cross-country skiing. The biggest percentage increase has been in adventure sports like kayaking and mountaineering.

To accommodate some of these trends, more work is going into developing recreation "concepts," where recreation attractions such as a string of lakes or a network of trails are integrated with Forest Service facilities. The Sayward Forest canoe route is one example. This 48-kilometre chain of low-level lakes, accessible from many points, provides an environment that seems almost wilderness in character.

Figuring out what's needed both now and in the future is just the first step in recreation management. Next come the trade-offs and compromises required in the day-to-day job of putting those plans into action, and the biggest challenge facing Forest Service planners is finding ways for forest recreation and forest harvesting to co-exist. "For example, in the Soo River area near Pemberton," says Rick Johnson, "we'll probably have no problem deleting a couple of hectares from the logging plan for a recreation site."

But critics point out that recreation management at this level doesn't replace the need to establish new parks. "Often, it really comes down to the Forest Service deciding between which two stumps to place the picnic table," says Western Canada Wilderness Committee spokesman Paul George, at least half-seriously.

"I don't see our job as simply being a token response to recreation needs," argues John Tisdale. "We give input directly into the logging plans; we note recreation values on the maps so that decisions are made with some knowledge and appreciation of recreational concerns. By the time the loggers come along, our homework is done. This year I'm aiming at a complete reconnaissance of recreational opportunities in the Campbell River district."

Rick Johnson is aiming for a reconnaissance of his Squamish district as well, but funds are scarce. With just two hours of helicopter time available, he finds it hard enough to inventory even one watershed, let alone the entire district. But he's already familiar with the area, and he counts on advice from experienced recreationists who have spent some time exploring the territory.

Are these formal and informal attempts at identifying and preserving recreation values enough? Not according to Robin Draper of the Outdoor Recreation Council. As executive director of the coordinating body that works on behalf of 38 B.C. outdoor organizations, he makes it his business to evaluate the ministry's recreation efforts.

"The work that is being done at the regional and district level is an honest effort," Draper says. "But the question is — are the people there being hampered by the policies they have to work with?

"If you compare the Ministry of Forests with the U.S. Forest Service, you can see that in the U.S. they are really managing the land for recreation as well as timber. Why doesn't the Ministry of Forests have a wilderness policy, for example? Some forest managers think multiple use must be practised on each hectare of land, but we can still have wilderness compatible with multiple use.

"And greater emphasis should be given to promoting Forest Service recreation programs among the public."

Kamil Apt agrees that the Forest Service is behind on staffing. "Who isn't?" But when it comes to inventorying recreation opportunities as a basis for making management decisions, he feels B.C. is ahead of the U.S.

"By 1984 we will have classified all Crown land under our jurisdiction according to its recreation values. Then we'll be in a much better position to identify and meet the diverse needs of its users. These include wilderness style uses, widely dispersed activities in the woods, and the more concentrated uses such as those in the Sayward. But whatever emphasis we give to an area, it will have to fit into the total spectrum of forest use."

Future developments in the Ministry of Forests' recreation programs will be subtle ones, notes Apt. They will include less obtrusive clearcuts in scenic areas. They will reflect a more recreation-conscious attitude held by loggers. They will be flexible enough to react to changing patterns of recreation. And they will still include a campsite on an icy blue river with a bench and a view. ◻

Dr. Andrew Thompson

by **Peter Grant**

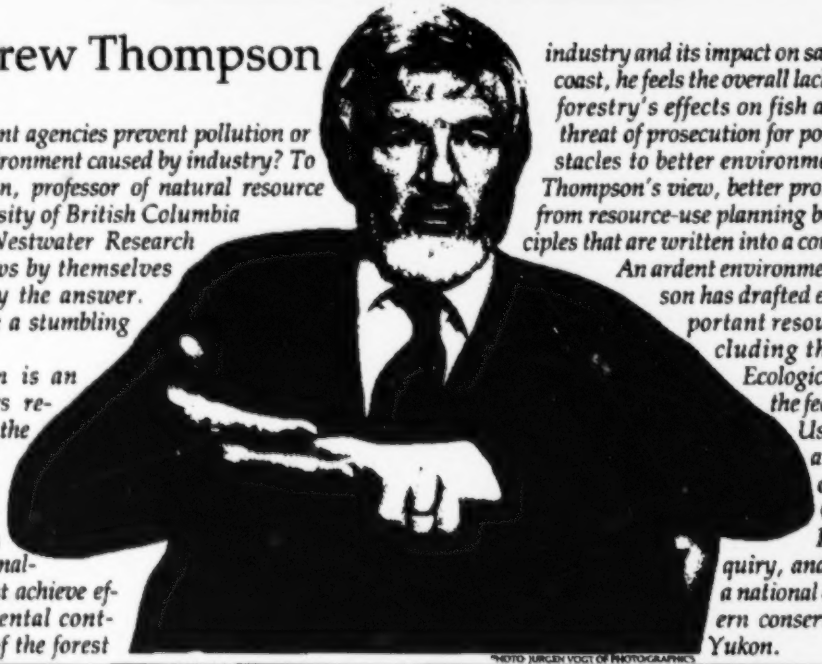


PHOTO: JURGEN VOGT OF PHOTOGRAPHICS

How do government agencies prevent pollution or damage to the environment caused by industry? To Andrew Thompson, professor of natural resource law at the University of British Columbia and director of Westwater Research Centre, strict laws by themselves aren't necessarily the answer. They may even be a stumbling block.

Dr. Thompson is an expert on matters relating to law and the environment, and his book Environmental Regulation In Canada *offers a sobering analysis on how to best achieve effective environmental controls. In the case of the forest industry and its impact on salmon along the B.C. coast, he feels the overall lack of knowledge about forestry's effects on fish and, ironically, the threat of prosecution for polluters, are huge obstacles to better environmental protection. In Thompson's view, better protection would result from resource-use planning based on agreed principles that are written into a contract.*

An ardent environmentalist, Dr. Thompson has drafted early versions of important resource legislation, including the province's 1971 Ecological Reserves Act and the federal Northern Land Use Regulations. He's a former chairman of the B.C. Energy Commission and the Kitimat Oil Ports Inquiry, and recently he chaired a national conference on northern conservation policy in the Yukon.

FORESTALK: What kinds of laws do we have to protect the environment from damage caused by industry?

THOMPSON: When the environment first became of great concern — this is going back to things like Rachel Carson's book about pesticides, *Silent Spring* — the approach taken was the standard one lawyers and legislators use to change people's behaviour: to prohibit them from doing this or that. If people pollute, that's an offence subject to prosecution, and the polluters are to be fined or punished. The system of environmental regulation developed on that basis.

FORESTALK: Does it work?

THOMPSON: There has been a lot of frustration over the years. Environmentalists feel there's not enough enforcement of the laws, and pollution still occurs. If you're in industry you're frustrated because you don't often get very clear reasons for prohibitions put on you; often there's a strong sense that enforcement is more to satisfy an angry public than for anything else.

FORESTALK: How well do you think our environment is being protected?

THOMPSON: In some cases, after years of effort and millions of dollars spent to deal with pollution, there is no evidence to show that anything is being accomplished. The process doesn't work at all as one would think. We found an enormously hit-and-miss approach to enforcement of environmental regulations across Canada.

FORESTALK: A recent B.C. Ministry of Environment public opinion survey found that many people want more environmental regulation.

"If people in the Ministry of Forests are going to manage for multi-use and not just forest use, they've got to convince us they're not so dominated by the forest-use side of things that their roles in these other areas are just token ones."

THOMPSON: Not just more regulation, but more prosecution, I'm sure. However, prosecution isn't effective or efficient; it doesn't gain pollution control. Maybe the idea of pollution has evolved in the public mind to the point where the symbolic aspect of prosecutions and penalties is important. Finding someone to hang the guilt on is an essential part of this thing. I'm an environmentalist in my own and the public's mind, but I believe that better environmental protection will result only if we get away from prosecution.

FORESTALK: A Westwater Research Centre study of the forest industry on the B.C. coast made the point that protection of salmon habitat is best accomplished if a bargaining process is set up among the regulatory government agencies and the forest industry. But can bargaining be effective in regulating environmental damage if law enforcement isn't?

THOMPSON: If it's a case where the industry has to get a permit — say for water effluents from a pulp mill — the process starts with the people from the provincial Waste Management Branch sitting down with industry people of similar training and background. The engineers get together and the plant people get together. They trade information, have meetings and discussions and try to figure out what to do. This kind of bargaining goes on all the time, even when the issues get quite acute.

FORESTALK: Does the same bargaining happen when a company wants to log in a salmon stream?

THOMPSON: The tree farm licence system of cutting permits incorporates the idea that every five years there will be a basic review of the licence. Cutting plans are negotiated year by year. So there is a relationship of ongoing negotiations between the Forest Service and the company. It's a very effective way of dealing with things, with a couple of shortcomings.

FORESTALK: What are the shortcomings?

THOMPSON: One is that the public that would be affected — for example, the Haida people in the Queen Charlotte Islands — quite rightly want to have a greater voice in the process of negotiating management and cutting plans. It shouldn't be left just to the professionals in the Forest Service and the companies. There's great pressure to involve the public in the bargaining process.

Another problem is that the Federal

fisheries department legally can do what it likes. Company logging plans are referred to the Department of Fisheries, and fisheries people attend the discussions and negotiations. But no matter what they commit themselves to in discussions, they're not bound by it.

This is a point Peter Pearse commented on in his fisheries royal commission report. Pearse recommends that federal fisheries should be authorized to give binding approvals to companies.

FORESTALK: Isn't the fisheries department obliged to prosecute if there's environmental damage?

THOMPSON: There's some concern that the department is prepared to throw the book at a company for actions that have really minimal effects on fish. But sometimes it's better to write off the fish in one area and concentrate fisheries management somewhere else.

FORESTALK: What effect does prosecution have on regulatory bargaining?

THOMPSON: Then the negotiations aren't followed through. Say a toxic spill occurs near a pulp mill, and there's a fish kill. It triggers some public reaction. All of a sudden the heat is on the politicians. If there's enough heat generated, the Waste Management Branch is under pressure to prosecute the mill.

We've examined enough examples of this kind to see what happens. There aren't any more meetings or exchanges of information. Everyone has to draw back. Once you have a prosecution a different set of officials gets into the act — from the attorney general's ministry and, at the federal level, from the prosecution side of the environmental protection group.

The companies really resent it when negotiating goes into the criminal mode. They get their good lawyers, and the area is so full of technical uncertainties that they can usually do a pretty good job. And for a year or two not a damn thing happens towards better environmental control. That's not rational.

FORESTALK: The forest industry's handling of logs in estuaries raises concerns about harm to salmon stocks. The forest industry seems to want proof that harm occurs before it will change its ways.

THOMPSON: In a situation where something has been going on for many years, like storing logs in estuaries, whole operating systems build up around it. To change these systems costs quite a bit of money.

There's also a concern that storing logs in estuaries seriously interferes with the rearing of juvenile salmon and, in some cases, with spawning. As well as the straight question of environmental damage, there is often competition for estuary use from such things as recreation. In this case you can understand industry's position: "If you're going to tell us we've got to get out, you'd better be able to convince us there's a good reason."

FORESTALK: What's needed to make environmental regulation work?

THOMPSON: What is needed are much more sensitive approaches to regulation. Any approach has to recognize that there are great uncertainties of a technical and scientific nature.

FORESTALK: What uncertainties are there in fish-forestry interactions?

THOMPSON: One of the things we've been surprised at in Westwater is how little effort has been made to deal scientifically with questions needing problem-specific or area-specific research. Only now we're starting to get some data about what actually happens to juvenile salmon around logs. You'd think that was something that would have been looked at 10 years ago.

FORESTALK: Is that why Westwater did a study of salmon in log booms on the Fraser estuary?

"The companies really resent it when negotiating goes into the criminal mode. They get their good lawyers, and the area is so full of technical uncertainties that they can usually do a pretty good job. And for a year or two not a damn thing happens towards better environmental control. That's not rational."

THOMPSON: It's common sense to say that if you foul up an estuary which is a habitat for juvenile fish, it's going to affect them in some way. So we set about to demonstrate what the effect is.

Much to our surprise, we found that salmon didn't avoid the log storage areas. Instead, the abundance of juvenile salmon is about the same in the log storage areas as in the natural parts of the estuary. And they would appear to be growing just as well — in some cases even faster — although their stomach contents are different.

So you just can't jump to the conclusion that log storage is harmful to juvenile salmon. But neither does it tell us anything about whether or not those juvenile salmon will actually survive in the oceans and return to spawn as effectively as juveniles reared in the natural portion of the marsh.

FORESTALK: Is information just as sketchy about the effects of logging on salmon streams?

THOMPSON: In our study of the fishery-forestry conflict we just couldn't draw any simple conclusions about, for example, streambank protection. There's nothing conclusive that leaving trees along streambanks helps salmon or doesn't help them.

FORESTALK: Given these uncertainties, what will protect salmon habitat besides the threat of prosecution?

THOMPSON: We think that the way to handle this is for federal fisheries to negotiate a formal contract along with the provincial agencies and the companies involved. A contract offers more flexibility in dealing with problems, and the companies won't be nervous that the whole process could move into prosecution. The criminal law will still apply in cases where there's wilful defiance or gross negligence, but not in cases where people are trying responsibly to come to grips with a difficult problem.

FORESTALK: How would a contract change the negotiating process?

THOMPSON: First, the fisheries department should develop a policy that puts priorities on certain areas. Then it can sit down with industry and say: "Logging is taking a toll of these spawning areas. We'll withhold prosecution even though harm is occurring, but by golly we're going to bargain with you and it's going to cost you money. You're going to have to offset these fish losses by contributing to the enhancement work that's being done over there."

FORESTALK: What if the forest industry doesn't want to pay for habitat enhancement?

THOMPSON: The industry can't have it both ways. It can't be spared prosecution without being responsible for costs it's imposing on the fishery resource. Besides, the province has already accepted the principle that the polluter should pay.

FORESTALK: You mentioned the need to include other forest users in this bargaining process. How well do you think the Ministry of Forests is equipped to listen to all types of resource users?

THOMPSON: The way the Ministry of Forests goes about negotiating management plans is exactly the kind of thing we're talking about. While it's got that bargaining process in operation, others are going to want to get into it. But forestry doesn't have an automatic priority over other resource uses.

FORESTALK: Do you think the Ministry of Forests can live up to its mandate as a multiple-use manager?

THOMPSON: It's a sound idea, but it's only going to be successful if the ministry really means it is prepared to be a multi-use manager and take account of the tradeoffs.

Talking with people in the ministry, I think they do want to be multiple-use managers; they recognize that if they manage strictly from a narrow, single resource perspective, they get in all sorts of trouble. If they're going to manage for multi-use and not just forest use, they've got to convince us they're not so dominated by the forest-use side of things that their roles in these other areas are just token ones.

After the Fire

by Doug Leighton

A raging forest fire is an awesome spectacle. It is nature run rampant, intoxicated with its own power and consuming all in its path. Yet from the destruction of the old comes new life; another cycle begins.

In the cooling ashes beneath the charred skeleton of the old forest lie revitalized resources of untapped nutrients. With the shading forest canopy gone, sun and rain bathe this new earth.

Many sun-loving plants, their seeds lying dormant in the soil, have waited long for this moment. Fresh green shoots spring up everywhere. Fireweed, carried by wind-borne seeds, is quick to exploit this new frontier, carpeting the land with the rich purple-pink hues of its blossoms.

Shrubs such as huckleberry, willow, and snowbrush, and deciduous trees such as aspen, birch, and cottonwood, burst the blackened soil, powered by the food reserves of their subterranean root systems which were undamaged by the fire.

There is abundant food for herbivores in this surge of new growth. Mule deer and moose, black bears and blue grouse, countless grasshoppers, caterpillars and pollinating insects share in the floral feast. Each in turn then become food for the many predators lured to this rich new habitat. As black turns to green a new food chain is built, a new community is born.

Scarcely noticed amidst the lush profusion of after-fire growth, diminutive lodgepole pine, Douglas fir and other conifer seedlings have taken hold. The future belongs to them.

bush katydid

timber wolf

grouse

alpine fir

heart-leaved arnica

bear in huckleberry

Indian paintbrush

LETTERS

Herbicide Debate Continues

Your Spring, 1983 issue contained a letter from D.E. Handley regarding your land-use article on the use of herbicides. In his letter he blames the use of herbicides by foresters for that of farmers and home gardeners, all wishing to rid themselves of weeds.

The analogy is not a good one. We are to maintain our forest land in Canada [illegible] a single purpose – the [illegible] of the forest.

[illegible] appropriate. The [illegible] are however the source of many other [illegible] economic and [illegible] purposes. These would also be badly affected by the use of weed-killing poisons. No one [illegible] to [illegible] herbicides [illegible] to [illegible] to [illegible] to

more toxic than 2,4,D, but ask someone whether he would rather take a bath in a pesticide or a herbicide.

Dr. Strang joins us on the powerful myth of scientific objectivity. In this case, most people believe that scientists are indeed rational, objective and untainted by politics, conflicts of interest and other bad tastes. Not necessarily so, recall the conflicting conclusions by Canadian and U.S. researchers about acid rain.

Brief enough to be told that the U.S. Advisory Committee on Pesticides found no sound medical or scientific evidence that living creatures in our environment are harmed by the recommended use of 2,4,5-T herbicides. One also needs to know who was on the Committee, what were their affiliations, who funds their research, were there any labour representatives, etc. It also helps to know that the study was commissioned by the Ministry of Agriculture, Forestry, and Food, an agro-industrial arm of a very conservative government.

And even if eventually you were convinced that the stuff is safe, you still might believe that herbicides are overly unneeded, bad karma, part of a Communist plot aimed at enslaving women.

Jim Pojar
Ministry of Forests
Smithers

Sustained Yield Via Incentives?

I was pleased to see Wendy Bergerud's article on Sustained Yield and Another Myth ("Mr. Bergerud goes to Hagen" in Sweden's largest forest company was shocked that its Swedish owners, Bill and Dottie Beattie, Swedish experienced them some years ago. We could learn much from the Swedish experience.

1. Not many years ago Sweden had a problem paralleling the current situation in B.C. Where the cost of growing and harvesting a tree was viewed as the planned rotation age at compound interest, the amount was greater than the anticipated value of the tree. (This was changed by simply viewing the cost of planting, etc., as a current expense. In B.C. you could we presume, throw this into our dummy appraisal system?)

2. Most of Sweden's forest land is privately owned, approximately [illegible] by the large companies, 25% by many small landowners and 15% by government. While private ownership contributes to the fact that the land outside the private companies' holdings is not managed as intensively as it could be, the fact that the private companies know the certainty that they will be the ones who benefit from increased investment makes the B.C. situation [illegible]. As the price of selling our forest land to non-Canadians would be absurd to be unacceptable to the people of B.C., we should consider extending the present terms of tenure over a much longer period of time. Another option is long-term land rental agreement. Industry would then have the incentive for maximum utilization and silvicultural practices.

3. Due to private ownership the large Swedish companies do a considerable amount of research and development in silviculture. The condition does not appear to exist in B.C. because as long as approved measures are carried out the government picks up the tab via section 88. It seems appropriate for large private companies to lead the way and spend money on such things as cloth-bodied counties, development of new machinery etc., rather than government. This would [illegible] however, without some incentive. So here is one more drive to achieve sustained yield for whatever you wish to call it, to find some suitable means of providing that incentive. Only in this way can we tap the very considerable human and financial resources of the private sector and to enthusiastic communities.

Frank D. Romano
Western Tree Seeds Ltd.
Shuswap

Rogue Forester

I've just recently become aware of your Free Talk magazine. The variety and depth is impressive.

Could you please send me [illegible] that I can subscribe to it and [illegible] help keep them current with their professions.

Robert J. Doche
Rogue River National Forest
U.S. Forest Service
Medford, Oregon

Sopron: It's been Good To Know You

As one of the Sopron people [illegible] Fall/Winter 1982) who came to B.C. in the aftermath of the 1956 Hungarian revolution, I was interested to see an article about Sopron in your magazine. Free Talk and Canadian Dimension are always well worth reading, but the one particularly was [illegible] the several people I recognized in the picture. Two of them were my classmates.

E. T. Pond
Ministry of Forests
Vancouver, B.C.

As a young Canadian whose ethnic background is Hungarian, I was very pleased to read Gordon Pinsent's article "The Sopron People" which appeared in the Fall/Winter 1982 edition of your magazine.

Being a Canadian, naturally born here and a Hungarian through my blood, it was with a sense of pride that I read the Sopron people and the contribution that they have made to this country in bringing their skills and talents here to Canada.

What it must have been like [illegible] to all but them to leave Hungary as I am sure most have been for an uncertain future, to uproot their families from [illegible] their country and friends that they've grown up with.

Mr. Pinsent's article added very interesting and worthwhile information to my knowledge.

Thank you.

Steve Kovacs
Ottawa, Ontario

Malaxis Mix-up Mended

[illegible] through the spring 1983 issue of Free Talk, I found on page 32 an article [illegible] "New Plant".

I have always been fond of the [illegible] and have had many opportunities to observe the woods and the islands that are our natural habitat. [illegible] month to [illegible] plant. I would [illegible] to see that Malaxis would be accompanied as we believe that the plant was completed [illegible].

[illegible] the word [illegible] previously, but [illegible] in the standard wooded area [illegible] [illegible] plants of the genus Malaxis. [illegible] [illegible] [illegible]

I was the last one out of Fireside. I went around to each building checking to see that they were empty. I taped each door closed behind me. Then I noticed the dogs left behind and began loading them into the back of the truck. One wouldn't leave; she kept going back to her doghouse. I finally figured it out and brought out her two puppies. By the time I left I could already hear . . .

THE ROAR OF THE FIRE

by Douglas Cowell

White from lack of sleep and jittery from living on coffee and adrenalin, Harry Hutchinson, a Ministry of Forests forest officer from Smithers, is recounting the hectic events of July 29, 1982. That was the day the EG fire made its run, and that was the longest day of Harry Hutchinson's life.

Earlier that week Hutchinson had been called in to help out with one of the worst outbreaks of forest fires northern B.C. had ever seen. To the northeast, the still-unmapped HUT 14 fire had behind a massive pall of smoke. The Yukon Forest Service was battling WATSON 12 and 13 in the northwest. The town of Lower Post near the Yukon border, where the B.C. Forest Service had set up its fire command centre, was being threatened by its namesake, the LOW fire. And the EG fire to the south had already gobbled up 20,000 hectares of bush, muskeg and trees.

Hutchinson was assigned to the 250 hectare priority fire called the CRAN. Located near mile 550 on the Alaska Highway, 13 kilometres west of the village of Fireside, the CRAN threatened the highway, several small settlements, the telephone lines and a microwave tower crucial to communications throughout northern B.C. and the Yukon.

On July 25, fireboss Ken Brahnuk and Hutchinson, along with 30 firefighters, most of them locals and many of them from the Liard Indian band at Lower Post, set to work. They had three crawler tractors, four tanker trucks and two helicopters. First they circled the fire with catguards, which are long trails through the forest bulldozed down to bare earth. Then

they strung out hose lines and pumps, supplied with water by tanker trucks, and soaked down the adjacent timber. The long days were smokey, hot and dusty; the nights short and chilly.

Firefighting is seldom fun or exciting. It's either long hot days of hard manual labour or terrifying, hasty retreats. Still, the workers struggled on against the CRAN, finally getting the upper hand.

But there was more trouble lurking. More than a month earlier, in a vast, uninhabited expanse of muskeg and low hills called the Liard Plain, two lightning strikes had started a fire near the remote Egnell Lakes. Dubbed the EG fire, on the day it was discovered it made a 16 kilometre run north and jumped the Liard River at Contact Creek. Tim Van Horlick was rushed in from the Forest Service's Lower Post station to keep the EG from threatening life and settlements along the Alaska Highway. During the first week of firefighting the settlements of Contact Creek and Iron Creek had to be evacuated.

No one was living south of the river, and there were no man-made developments other than a few unoccupied trappers' cabins. Except for a narrow band of spruce along the river's edge, the Liard Plain didn't hold much useable timber. There were no roads in the area, no bridges across the Liard, and no barges available, making it virtually impossible to get heavy equipment to the fire.

That meant that the best way to fight the EG south of the river was to take advantage of natural firebreaks (such as the river itself) to set backfires — controlled fires set in advance of the main blaze to slow it down. As well, the Forest Service set up a fully equipped firecamp at Contact Creek to keep the EG from spreading further north.

On July 25 a cat operator making a new fireguard was surrounded by fire and, as he was trained to do in a last-ditch situation, scraped as large a circle of bare dirt as he had time for, parked his cat in the centre and crawled underneath.

A big Bell 214 helicopter working nearby spotted the trouble and quickly cooled the flames with several monsoon bucket loads of water. Another, smaller chopper bucked and tossed through the wind and smoke, set down on the tractor's canopy and lifted the catskinner to safety.

(Below) ***Last summer when the town of Coal River found itself directly in the path of the EG fire, the town's buildings were watered down continuously to prevent them from catching fire. Miraculously, the EG left the town untouched.***

(Above) ***Once a forest fire gathers momentum, it can explode from tree crown to tree crown with terrifying speed.***

The first rule for firebosses is to remain calm. They're constantly called upon to make important decisions on insufficient evidence, to prepare for any eventuality, to outsmart the fire. And they have to be right the first time. Brahmuk, the calm, astute fireboss of the CRAN fire, was constantly watching, calculating, keeping in close contact with Van Horlick on the FC. The more exuberant Hutchinson was in constant motion, acting as lineboss and expeditor as he led the men through the heat and dust on the CRAN fire line.

"On the 26th we were busy trying to hang onto the CRAN," Brahmuk recalls, consulting his log. "By mid-afternoon the winds were gusting to 60 km/h and the fire escaped across our guard in several places. It was a pretty wild day, and when I checked the FC it was still 25 kilometres away and not doing much."

On the 27th and 28th the men widened the fireguards and manned the hoses. Things were well in hand and all the fire forecasting indicators said there was little danger of high winds for the next day. But at 2:28 p.m. on July 29 Brahmuk got a radio message from Van Horlick.

"Looks from here like the south flank of the FC is up and running your way. You'd better pull out!"

In moments Brahmuk was in a helicopter and climbing through the smoke. What he saw was the most awesome display of power and destruction he'd seen in his 10 years of fire fighting.

A wall of flame fully 200 metres high and 25 kilometres long was coming at him and his crew. It was now only 12 kilometres away and coming fast.

Quickly he radioed Hutchinson and ordered an immediate evacuation of the fire line. Then he called headquarters and requested they alert the residents of Fireside to be prepared to evacuate the village.

"When we were still maybe five kilometres away we could feel the radiant heat from the fire," he recalls.

What Brahmuk and his pilot were watching is called a "running crown fire." As soon as a fire moves from just being a ground fire and climbs into the treetops, it can explode from crown to crown and soon gather terrifying speed. As the intensity and size of the conflagration grew, more and more air was heated and rose in gigantic updrafts. Cool air, being sucked in at ground level to feed the flames, created hurricane force winds.

The winds accompanying the FC fire that afternoon, estimated to be gusting up to 150 km/h, mowed down whole sections of forests. There were whirlwinds of flame. Whole trees, broken off by the winds, were tossed high into the air to suddenly burst into flame. Chunks of flaming wood, many of them several feet long, were tossed as much as a kilometre ahead of the fire, lighting up new spots.

By 4:30 p.m. the fireline was evacuated, the heavy equipment was parked in a nearby gravel pit, and the men were sent to try to make a stand at Fireside. A tanker truck was sent south to Coal River to block the highway. A second tanker went north for the same purpose. The Alaska Highway was shut down tight, although not all travellers realized they would have faced almost certain death if they hadn't been prevented from driving on.

By 5:40 Brahmuk was back up in the air watching the fire. The huge, rolling wall of flame was running fast. Relentlessly it leaped some 500 metres across the Liard.

The terse notes in his log read: "1730 hrs. In helicopter. 900 ft. flames crossed river. Made one-mile run in one minute and totally engulfed CRAN Fire. Advancing on estimated 15-mile front. Ten miles from Fireside. Advised Hutchinson evacuate Fireside."

"It was a pretty emotional scene," recalls Hutchinson. "Some of the women were crying. They didn't want

(Above) ***Garvan Cross normally fights fires by rappelling out of helicopters, but last summer while on contract to the Yukon Forest Service, he was sent to B.C. to act as a cat boss on the FC fire.***

(Right) ***At last year's Battle Lake fire west of Campbell River a tanker drops still-burning trees so they don't endanger firefighters nearby.***

(Left) The smoke from the 1978 KAT fire that burned up 2800 hectares between Kitimat and Terrace rose over 8,000 metres in the air and could be seen 100 kilometres away.

(Below) Helicopters keep refilling portable water reservoirs that supply the hoses used to fight the 1982 fire near Battle Lake.

to leave everything they'd accumulated over the years. They couldn't believe what we were telling them — what was coming at them. Finally when heavy smoke began rolling in they packed up and left."

It was a desperate situation. The rest of the crew dismantled their camp, cramming everything they could into the trucks, ensuring they had sleeping gear and food, and took off. On the way down the highway Hutchinson came upon a broken-down school bus and took along the driver and a few of his possessions.

Sixteen kilometres from Fireside is the tiny settlement of Coal River, nestled near the confluence of the Coal and Liard Rivers. Although it has a little more natural protection than Fireside, it too was soon evacuated. 130 vehicles were turned around and sent south to Liard Hotsprings.

Trapped by darkness and smoke, a helicopter pilot needed more light to fly out his machine. At midnight, and with the help of a pickup truck driven by a local cat-skinner, the pilot made a run for it. Against a backdrop of advancing flames and flying almost on top of the cat, the pilot followed the truck's headlights to safety.

Hutchinson remembers the evening. "Even before dark, at Lower Liard, 55 kilometres from the fire, you had to drive with your headlights and windshield wipers on. It was like driving through a fog in a blizzard, the smoke was so thick and the ash was coming down like heavy snow."

The crew ended its long retreat at 2:30 the next morning in a gravel pit near Liard Hotsprings. Some tumbled onto bedrolls tossed on the ground. About half of their tools and much of their heavy equipment was left behind.

The morning of July 30 dawned hot

and smokey. Dirty, groggy fire fighters dragged themselves from dew-soaked sleeping bags. Brahmnik and Hutchinson had been up all night trying to assess their losses and to plan a strategy for the next day.

A reconnaissance flight at dawn had shown their losses. The fire had run as far as Coal River but, miraculously, had left the settlement untouched. It had run 60 kilometres the previous afternoon, and only a change in the wind and an increase in the humidity had kept it from spreading even further. At that, the KAI had become the second largest fire in the history of the Forest Service — 162,000 hectares.

Herb Spence from the Fort Nelson office arrived to help with the job of fighting the fire and protecting Coal River. For the next two days crews worked around the clock cutting fireguards and soaking down the buildings.

Vast areas on both sides of the road were burning. Swaths of fire several kilometres long alternated with blocks of green timber. Some areas were only lightly burned by ground fires, others were scorched by the searing heat.

On one mountain the fire had been so intense and the winds so ferocious that, within perhaps an hour, a complete ecosystem appeared to have been reduced to a moonscape of rock, gravel and fine powdered clay. Even the topsoil seemed to be gone, the ashes blown away by the wind. From hilltop to hilltop for as far as you could see it was lonely, desolate, and black.

*(Right) **At its peak the KAI fire had 500 firefighters working on it, and it cost $600,000 to finally put out.***

*(Above left) **A cat operator practically drives right into a forest fire to build his fire guards. Sparks often ignite piles of tree needles inside the cat frame that in turn can set grease and oil burning. These machine fires are difficult to put out.***

The village of Fireside was a bleak sight. The motel, a garage, several outbuildings and five homes lay smouldering. And yet in the erratic, unpredictable manner of wildfires, half the settlement was left untouched. Later, angry villagers were to charge the Ministry of Forests

(Left) ***Head cook Leona Ultheruille at the EG fire camp would serve supper at 10 p.m. and then be up at 3 a.m. the next morning preparing breakfast for new crews of firefighters.***

(Below) ***One afternoon the EG developed a wall of flame 200 metres high and 25 kilometres wide and travelled a full 60 kilometres. Whole trees, broken off by the winds, were tossed high into the air.***

with not doing enough soon enough to keep the fire from their town.

"One look at old burn patterns around there should show people that fire is a natural part of the ecosystem." Fireside itself sits in the middle of a pine stand that owes its existence to fire," explains the ministry's Paul Pashnik, regional protection officer in Smithers. "In general, small communities should consider building fire breaks around the towns. And for years we've been advising people that if they're going to build their houses in the trees, they should remove anything combustible from around their houses and even set up a sprinkler system to protect their roofs."

But fire bosses concede that with a fire as massive as the EG, even the best fire protection efforts probably wouldn't have had much of an effect. Once the EG was up and running, firefighters only had a three-hour warning that it was headed for Fireside. Comments Pashnik: "It was like trying to stop a runaway freight train on a downhill grade."

Why did the EG make such a devastating run? Pashnik explains: "To do that a fire needs perfect conditions. It needs hot, dry weather; it needs wood that is extremely dry, and it needs strong winds to fan the flames. We certainly had the dry weather and the dry fuels, but no unusual winds were forecast. We had been monitoring the fire closely, always assessing its potential. What got it going were unpredicted 70-km/h winds from the west. Rarely in the annals of firefighting has such a run occurred."

To get an idea of the size of the fire, imagine driving the 150 kilometres from the Port Mann Bridge east of Vancouver to the town of Hope. Now imagine all of that country and 15 to 25 kilometres on either side of the highway on fire. The EG fire covered an area at least that big, incinerating more forest than was burned in all of the province the year before — itself one of the worst years on record.

The microwave tower near Fireside got off with a scorching, but 80 kilometres of the Alaska Highway now runs through a barren land of black. Two traplines, which included four trappers' cabins, were destroyed.

Animals and birds normally can out-maneuver an advancing forest fire, but there's concern that considerable wildlife might have been caught in the path of the speeding EG. One day, firefighters watched helplessly as a singed grouse flopped and floundered its way across the highway.

But most importantly, there was no loss of human life and no serious injuries. "When communities had to be evacuated, the Forest Service was there," says Paul Pashnik. "It's not the direct responsibility of the Forest Service to carry out evacuations, but we were right on the scene. There was no way we were going to walk away from it."

Brahnik, exhausted after seven days on the job with only one good night's sleep, left for home as Forest Service employees from around the province flew in to relieve the exhausted fire managers. Arriving to help with the EG was Garnett Grimaldi, who had been fighting the 1,000-hectare LOW fire outside Lower Post. A 32-year Forest Service veteran from Penticton, Grimaldi has fought fires in almost every part of B.C.

The Ministry of Forests uses a fire command system based on a military format. Each winter it trains its staff in firefighting techniques and assembles Overhead Teams, known as "O" Teams. In the fire season, if local staff in any part of B.C. are overwhelmed by a number of fires, these teams, typi-

cally composed of a fire boss, line boss, camp boss, expediter and timekeeper, are called in.

The ministry handles an average of 2500 forest fires every year, 90 percent of these are brought under control within 24 hours of being spotted. The large burns like the EG and CRAN are the exceptions.

By the time Grimaldi arrived, Harry Hutchinson and Herb Spence had pretty well finished setting up camp at Lower Liard, a rough airstrip a little closer to the fire. Equipment, supplies and new manpower had been rounded up — in a location over 200 kilometres from the closest grocery or hardware store or Forest Service warehouse. One morning breakfast was corn flakes, Kraft dinner and coffee. Soon a complete kitchen on wheels was installed, along with first-aid facilities, a radio tent, weather station, fuel dump for the helicopters, and a tool cache.

Gramaldi's job was to set backfires to prevent the EG from picking up momentum again. He explains, "The first thing you have to do is find a natural firebreak — a river, a line of rocky hills or swamps — and set a fire along that line. The main fire should break its own momentum and deprive itself of fuel by sucking the backfire into itself."

To light his backfires, Gramaldi used an Aerial Ignition Device, a machine mounted on a helicopter that drops ping pong-sized balls filled with chemicals that ignite on the ground. Flying in low, he lit up long lines of fire in a classic backburn.

Still there remained weeks of work. Fireguards had to be pushed and widened. The crew shifted into mop-up procedures, burning off areas of potential danger, finding hotspots with an infrared scanner and putting them out.

Gradually the days grew shorter, the nights colder and the danger faded. Only winter would really put the fire out and, even at that, spring patrols with the infrared scanner found patches of peat bog still smouldering.

(Top) ***The 1982 EG fire ran right through the town of Fireside, burning out the hotel, a garage, and five homes. But in the unpredictable manner of wildfires, half the settlement was untouched.***
(Above) ***Three weeks after the EG fire had run its course, new vegetation was already beginning to sprout up. The following year fireweed filled many a burnt landscape.***

As devastating as the fire was, the wounds began to heal quickly. Jim Schwab, ministry researcher in Smithers, found new vegetation sprouting up three weeks after the fire had passed through. "Wildfire burns very unevenly, even in areas that appear severely burned," says Schwab. "Light and moderately burned sites regrow spontaneously."

The fresh shrubs and herbs attract wildlife such as muskrats, beaver, moose, elk and bear. Cougars and wolves likely will move into the area as well, as may certain kinds of grouse. Black spruce and lodgepole pine regenerate from the seed of their fire-killed parents, and there are usually remnant seed sources for white spruce. Aspen, cottonwood and birch sprout anew from their roots. A new forest is born.

"This north country is capable of supporting a much more productive forest than is generally realized," Schwab explains. "It's the recurring fires that prevent it. I doubt that man can ever control that." ◆

A Message From The Minister Of Forests

"This Is The Last Issue Of ForesTalk"

As much as I regret that this is the last issue of ForesTalk, I am afraid that current financial circumstances make its cancellation unavoidable.

We are all aware of the extremely valuable role that ForesTalk has performed in creating awareness and understanding of the province's forest and range resources and of the many factors affecting their management.

Since ForesTalk commenced publication 10 years ago, its outstanding quality has been recognized many times in the form of awards for excellence in writing and design. Even more gratifying has been the enthusiastic response of ForesTalk's nearly 250,000 readers in all walks of life and every corner of the province.

I would like to thank the magazine's loyal supporters and the many other people who have contributed to ForesTalk's success — its editor and designer, their associates in the ministry's Information Services Branch, and the host of freelance writers and photographers who have given the magazine its form and substance.

T.M. Waterland, *Minister of Forests*

Junior Forest Wardens

The 53-year-old message of giving young people an appreciation and awareness of our forests is as timely as ever.

Throughout the 1930s and 1940s, Junior Forest Wardens across B.C. spent their summers keeping their eyes peeled for forest fires. In the off seasons they educated their classmates and communities about the importance of fire prevention and forest conservation. Some of these Junior Forest Wardens grew up to be today's foresters; another became today's Minister of Forests.

Founded in 1930 for boys aged 10 to 16 by the B.C. branch of the Canadian Forestry Association, this volunteer-led organization now includes girls as members and has a "Pathfinders" division for children aged seven through nine. In 1960 it went national, the Junior Forest Warden Association now coordinates programs in Alberta and the Maritimes and has affiliates in Quebec and Newfoundland.

The scope of the program has broadened as well — from fire prevention to all aspects of forest management. Today, several clubs near Vancouver manage a Christmas tree farm, and a Powell River club is involved in a salmon enhancement project.

Over the past decade, however, fewer and fewer children have chosen to don the distinctive red shirt of the Junior Forest Warden. Concern over this declining enrolment has led JFW alumni to try to revitalize the program. "It meant so much to us as youngsters," explains Bill Myring, a 1935 Junior Forest Warden who is now Chief Warden for Canada.

Plans for rejuvenation include overhauling outdated training manuals and hiring a paid provincial coordinator. But according to JFW enthusiast Bert Gayle, Vice-President of the Canadian Forestry Association of B.C., funding for the Junior Forest Wardens is a big problem. Looking at the healthy and generously-funded Alberta program, he insists: "With similar funding we could easily form 20 new B.C. clubs and properly service them as well as the existing ones."

If you would like to find out more about the program, contact The Canadian Forestry Association of B.C., 410-1200 West Pender St., Vancouver, B.C., V6E 2S9, tel. 683-7591.

(left) For over 50 years Junior Forest Wardens have been learning about the forests, and this year (right) vice-president Bert Gayle of Canadian Forest Products, Junior Forest Wardens Elaine Quarmoe and Kevin Yendall, and forest ministry chief forester Bill Young help planted Canadian Forest Products' 30 millionth seedling.

If You're Up Against The Wall — Paint It!

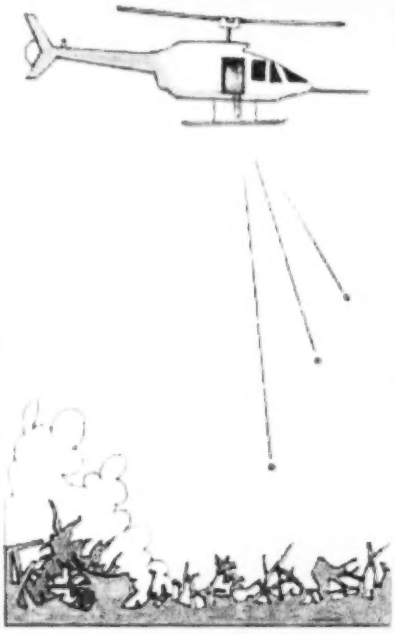
In 1862 a waterwheel was used to supply power to its first sawmill, and the town of Chemainus on central Vancouver Island went on to produce lumber for another 121 years. This is the town where H.R. MacMillan got his start, and where U.S. industrialists Andrew Carnegie and John D. Rockefeller once missed meeting each other by a mere 10 days as they travelled the island separately on timber business. The place to stay was the Horse Show Bay Inn where, for entertainment, a chained bear was kept out back for loggers to wrestle with.

Today the people of Chemainus are wrestling with their future as they wait to see if the big-log sawmill, which recently was forced to shut down, will stay closed forever. In the meantime they've taken advantage of the town's rich heritage in a unique way — by painting massive forestry-related scenes on the sides of some of the town's main buildings. This highly original downtown rejuvenation program recently shared first place in the North American Downtown Development Awards Competition held in New York.

Local business has picked up since this revitalization project got going, and starting this July 20, some 20 artists will be the main attraction in a month-long mural painting festival intended to complete the town's colourful restoration of its lively past.

Chemainus mural beside a parking lot

Great Balls of Fire!



The dangerous firefighting job of dropping down a rope from a helicopter to start backfires in rough terrain may soon be obsolete, thanks to the work of fire research technician Gary Lait of the Canadian Forestry Service's forest research centre in Victoria.

Lait has developed a device that spits out ping-pong like plastic balls that burst into flame a minute after ejection. The whole unit is officially called an Aerial Ignition System. When mounted in a helicopter or airplane, it can easily start a backfire in the path of a large forest fire, depriving the major blaze of fuel. Lait emphasizes that his device also works well in setting controlled fires needed to do such things as clear slash from logging sites or improve wildlife habitat.

It's all remarkably simple. Plastic balls half-filled with a common chemical are loaded into a hopper on the top of the device, and another cheap and easily available chemical, this one a liquid, is loaded into a tank inside the machine. A simple mechanism takes balls from the bottom of the hopper and, as part of the process of spitting them out, injects a measured quantity of the liquid.

It takes between 30 and 90 seconds before the balls begin to burn — slow and hot.

Lait's device has now gone into commercial production and is in use by firefighters and fire managers around the world.

The Edible Tree

Purple berry of the juniper tree

Certain parts of trees can be nutritious, if you know what you're doing. Consider berries and gum. The purple juniper "berry" (really a seed cone) was used by western American Indians as a condiment for roasts, stews and salmon. *The Art of American Indian Cooking* includes several delectable dishes flavoured with juniper. Several B.C. Indian groups are said to have eaten the red "berries" of the yew tree. The fleshy part of the "berry" itself apparently isn't poisonous, but all other parts of the yew, *including the seeds inside the berries, are highly poisonous.*

Indian people chewed the gum oozing from conifers to cure sore throats (they also used pitch as a healing salve for cuts, burns and scrapes). Some Douglas fir trees growing in the interior drybelt will, under certain conditions, exude a white crystalline substance in late summer that is sugary-sweet; the Thompson, Lillooet and Shuswap Indians prized it as a confection either to suck, or to sweeten other foods.

COLLECTIONS

The Network

The radio blurts out the message: There's a fire up Mud Creek, send a suppression crew. The fire grows; another radio call asks for a bird dog airplane out of Kamloops. Radio the pilot a read-out of the situation. Call for the air tankers to drop a load of fire retardent chemicals on the eastern edge of the fire. Get on the radio for more crew, a cook, and extra camp gear. Gerry's kids are in the office; get him to a radio to tell them he's fine.

To provide direct radio coverage to all the mazes of valleys that make up the British Columbia landscape would require many more than the 150 very high frequency (VHF) repeaters already perched on 150 mountain tops. Radio waves, like light waves, are stopped by solid objects — such as rocky mountain sides. Also, often a VHF repeater can't reach into a deep or remote valley, and parts of its broadcasting and receiving range are in "shadow." But that doesn't mean the firefighter's message doesn't get through. With some tricky mathematics and a little radio wizardry, specialists like Ministry of Forests manager of electronics Alex Stewart can find various ways to keep the ministry's 4400 radio sets in constant touch with each other.

While there may be more rock than air between two valleys, given a computerized reading of a troublesome landscape the experts can devise unique radio systems to link the valleys together. Radio signals will daisy-chain through several repeaters as they bypass mountain walls on their way from one hand-set to another. The talkers won't know that, of course. "The best system is one that people don't even notice," notes Stewart, who helped test the first Forest Service VHF radios back in 1951.

Salvaging the Hankin Cove canoe

Forest Finds

A Crown Zellerbach faller working a logging site in Kyuquot Sound three winters ago stumbled on something big the day he stepped through a salal bush and into a canoe that, to judge from the style of carving, had been there for anywhere from one to two hundred years.

A hole in the bottom, probably made by a seam of bark but not discovered until late in the carving process, at once condemned the canoe to a life in the forest and preserved it from decay by allowing rainwater to run through.

A team quickly formed to move the canoe to the B.C. Provincial Museum in Victoria. Along with people from the museum and Crown Zellerbach company operations, the project attracted an Indian carver, a member of the Kyuquot Indian band and the Heritage Conservation Branch of the B.C. government. The Hankin Cove canoe is the only example of an uncompleted coastal Indian canoe in the care of a museum.

The story doesn't end there. Because of careful logging in the area, the museum's ethnology exhibits curator Kevin Neary has been able to closely study the evidence of other Indian forest lore near Hankin cove. But Neary is puzzled at the choice of this site for both carving and slabbing (wedging cedar boards from live trees). "The site itself argues against such use; it is at the end of a steep hike up from the water and through very thick brush. Removing slabs, planks, canoes or other pieces of wood must have been incredibly difficult."

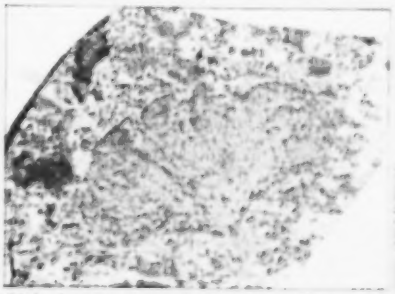
What Neary and fellow researchers really require if they are to unravel more secrets of the past are more Hankin Cove sites. Neary has nothing but praise for Crown Zellerbach's role in the canoe project, and he hopes that all logging operators, if they stumble across evidence of Indian forest lore, will treat that evidence with the same respect.

The Chinese Connection

The erosive power of running water cuts through sediment, glacial till and bedrock to expose older rocks buried beneath. Sometimes these rocks contain fossils that unlock the secrets of past eras.

One fossil site that has attracted considerable attention is the Driftwood Canyon near Smithers. Sandstone bluffs along the creek contain leaves and branches from trees up to 22 million years old. What at first appears as a black line proves to be, on careful examination, a pine needle. A more fortunate discovery may be a clear impression of a familiar alder or poplar tree.

But the most common fossils on the site come from a species of tree that is unlike anything growing in B.C. today. These fossils are from the Metasequoia, or the dawn redwood. Its closest North American relative is the redwood of California. The Metasequoia was long considered extinct, but in 1948 a group of explorers discovered it still growing in a restricted area of central China.



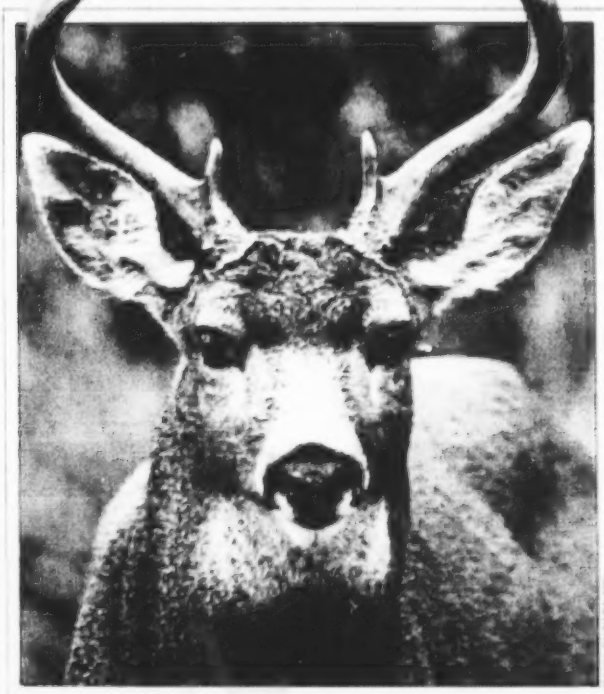
Ginko leaf fossil from Driftwood Canyon

Another Driftwood Canyon tree fossil with Chinese connections is the Ginko. It too was once thought to be extinct, but living relatives survive in a far corner of China. Leaves from this tree are so unusual that the Ginko has been placed in its own order of plants.

And what do the fossils of Driftwood Canyon tell us about B.C.'s ancient forests? It appears that B.C. once had a significantly warmer climate. There was little or no frost, and a large variety of deciduous and coniferous trees covered most of the land. It also seems that many species, which are presently confined to small areas, once grew in a large continuous forest belt. This mixed sub-tropical forest likely stretched across the entire temperate zone of North America, Europe and Asia.

THE BUCK STOPS HERE

by Peter Grant



Ministry of Forests Chief Forester Bill Young

Tilmo Kaputany, the Canadian Forest Products (Canfor) forester who has tended the forests of northern Vancouver Island's Nimpkish Valley for 21 years, wearies of the "bad guy" image he feels that he and his company have had to bear. "I'm not against deer. Canfor's not against deer. But I don't think that keeping high-value old growth stands for deer is the best use of our productive land base."

The Douglas firs of northeastern Vancouver Island, along with the hemlock, balsam and cedar, have spent hundreds of years fashioning themselves into some of the finest forests to be found anywhere in North America. While some stands have been preserved in provincial parks and ecological reserves, most of the remaining timber comes under the long-term logging schedules of Canfor's Tree Farm Licence (TFL) 37 and MacMillan Bloedel's TFL 39. Wildlife supporters contend that when this old growth goes, so will much of the deer and elk that rely on virgin forests for life-sustaining winter habitat.

"Most of the prime winter habitat on Vancouver Island has already been logged," says Doug Ianz of the environment ministry's Fish and Wildlife Branch. "But four to six percent of the remaining old growth in the north is good winter range for both deer and elk. We're at the point now of trying to protect the best of what's left."

A deer's life is poised on a sharp edge: winter means a continual search for food and continual maneuvering to evade predators. The thick canopy provided by the tree branches in old growth forests intercepts an estimated one-third of the falling snow, making travel and escape from predators easier. During severe winters, which in the Nimpkish occur once or twice a decade, the foliage and lichen from mature trees and the shrubs within old growth stands are the only food available; without this most deer would starve.

But protecting winter range in TFLs 37 and 39 would mean that every year over 85,000 cubic metres of prime timber couldn't be logged as planned; sawmills would be short that much raw material. The Ministry of Forests estimates that 153 workers would have to leave the region for work elsewhere. Canfor argues that there would be a loss of as many as 450 jobs, not to mention millions of dollars lost in tax revenues. Comments vice-president Bert Gavel: "Those 450 jobs are not only woodworkers' jobs, but those of people in support industries and the community at large. There's a ripple effect. When the faller at Woss Camp loses his job, it ends up costing the school teacher at Port Hardy her job, and the retail clerk's job at Campbell River, and the cat mechanic's job at Port McNeill."

Ken Bond is just heading back from checking a logging show on a small tributary of the Nimpkish River. As habitat protection technician for the Fish and Wildlife Branch, he observes forest company operations throughout the north island. One of Bond's duties is to protect salmon streams from logging debris and siltation, protecting wildlife habitat is the other side of his work.

Bond doesn't have the powers of the Ministry of Forests district manager to approve or refuse company logging plans, but he can influence the planning process. He often finds himself arguing the case for treating old growth forests as a non-renewable resource that must be preserved.

Notes Bond: "Climax forests develop over a long time, and species of animals, both invertebrates as well as vertebrates, have evolved with them. These stands serve more purposes than simply as deer winter range. Many other wildlife species rely on their diverse ecosystems, and they are highly valued for their recreational and aesthetic qualities. Once they're gone, they're gone."

The forest is quiet except for the occasional jackhammer drumming of a woodpecker and the trilling chatter of a red squirrel, warning other wildlife of the humans' presence. Stiff, bright green vaccinium and salal cover the ground, and greenish lichens hang off the tree trunks and branches. The odd snag leans against 300-year-old Douglas fir and hemlock trees, or stands upright, weathered down to the height of a 10-metre pole.

A few metres up the slope is a fallen log, now well rotted away, and around it a pile of discarded fir cones — the sign of a squirrel cache. The squirrel returns, sits on the log and keeps an eye out for danger as he eats. The same log may at other times be a stage for a ruffled grouse's courtship display, a maternity ward for weasels and voles, a front door for snake nests, a shield for resting deer, and a feast table for insect eaters.

(Previous page) ***Ed Bennett of Cantor falls an old growth Douglas fir in the Nimpkish Valley of northern Vancouver Island where, during severe winters, the resident Columbian blacktail deer*** *(below)* ***must rely on old growth stands for their survival. Another threat to deer survival in the Nimpkish is attack from wolves, and Klaklahama Lake*** *(right)* ***is the site of a Fish and Wildlife study to see if deer populations recover when wolves are removed from an area.***

Julius Kaptany stops on a log bridge over the Nimpkish River where brilliant red sockeye salmon undulate against the current on their way to spawn. "In my opinion, managing the Nimpkish for its fisheries values is more important than managing it for deer. The river has big sockeye, coho and spring runs, and an Indian band has a hatchery on Nimpkish Lake. Besides, I question the logic of wildlife management objectives in heavy snow areas like the upper end of the Nimpkish Valley. It would be less disruptive and less costly to concentrate deer management on the snowfree coastal plains of Vancouver Island."

Regional wildlife biologist Doug Janz doesn't agree. "The coastal plain is a relatively small area. And since it's all private land there is little we can do there to manage wildlife; we have more flexibility with TFLs which are mostly Crown land. The Fish and Wildlife Branch has target levels for deer populations on the Island and throughout the province. To reach those goals we'll need that winter habitat."

Cantor feels that the Fish and Wildlife Branch does have the authority to manage wildlife on private lands, and suggests that private landowners could be offered financial incentives to participate in game management programs.

In the final analysis, however, Kapitany feels that the real issue isn't old growth or deer at all, but the future of forestry. "Throughout B.C. foresters are fighting to hang on to any remaining land where they can practise forestry," says Kapitany. "The old growth question is a one-shot deal. But you take the land out of forest production and that's forever."

The problem, notes Ministry of Forests chief forester Bill Young, is simply that there isn't any more land available to meet both timber and wildlife objectives. "The land resource cupboard is bare. I appreciate the desire of wildlife people to preserve old growth timber as wildlife habitat. But we must remember that any decision to reserve this timber from future harvesting will mean an immediate reduction in the present allowable annual cut for the TFLs, with all the negative impacts that this implies. That's a decision only the government should make."

The ministries of forests and environment intend to refer the issue to the Environment and Land Use Committee (ELUC) of cabinet. ELUC in turn will be guided by a cost-benefit study of key old growth stands in Cantor's TFL 37 and MacMillan Bloedel's TFL 39. An important feature of this study is the fact that it was prepared jointly by the two ministries.

The report outlines the environment ministry's concern over declining deer numbers throughout B.C. at a time when public demand for recreational hunting, photographing and viewing of wildlife is on the increase. It estimates that if all the winter ranges in the Nimpkish Valley were logged, the area could support no more than 400 deer. In TFL 39, where some winter deer habitat has been set aside for 150 years as part of the Tsitika Watershed Integrated Resource Plan, the deer population should never drop below 1,900. If the winter ranges in both TFLs are left intact, the report says the deer population would average over 12,000.

Keeping the old growth timber would also hold the elk numbers to around 300, otherwise the population would fall to no more than 50 animals. These are Roosevelt elk, and Vancouver Island is the only place in the province where they can be found.

The report itself has been the subject of considerable debate. Cantor, referring to studies prepared by its own wildlife biologist, calculates that the Nimpkish Valley could support a minimum of 1,650 deer, over four times the report's figure of 400. But while the agencies and companies debate, it has been agreed to defer any logging in the disputed areas until the year 2002.

What would be the total cost in lost revenues if the timber isn't harvested starting in the year 2002? The report says the costs to the province — calculated today — could run as high as $13 million. For the 20-year period following the year 2002, the net cost of not logging the timber would be an additional $13 million.

And what of the benefits of preserving the old growth winter range beyond 2002? First, the report acknowledges the intangible benefits of people simply enjoying being around deer and elk and other species of wildlife that rely on old growth forest, and the agencies involved have agreed that the final decision on the issue will take these intangibles into account.

The report then estimates the economic value of the area for hunting to be $4 million over 20 years. But this figure does not refer to actual money being brought into the region. Rather, the $4 million is the economists' estimate of what hunters would be willing to pay if they were charged a user fee.

Using his company's own figures, Gayle estimates that the cost in reduced government revenues to provide winter habitat in TFL 37 amounts to $2,630 for every deer shot by a hunter. He adds: "The cost to the taxpayers to produce additional deer is 61 times the benefit to the hunters for that deer. One wonders why any practical forester or biologist would pursue the proposal beyond this point."

Cantor forester Julius Kapitany, an avid hunter himself, asks: "Why should the public subsidize hunters to that extent?" Nor is Kapitany convinced that the old growth stands are

essential to the deer's survival. "We haven't had severe winters recently, there's still old growth, and hunters only take 10 percent of the herds. Yet the valley's deer population has dropped 70 percent in 10 years. That's because of the wolves. The whole issue depends on whether we can control the wolf population."

Wolves are a fact of life in the Nimpkish. Their numbers have burgeoned over the past five years, although no one is quite sure why. But most people are convinced that wolves are the reason the deer population is down. Doug Janz believes that because much of the island has been logged and is no longer suitable deer habitat, the deer are funneled into discrete patches — old growth pockets for survival in the winter and newly logged openings during spring and summer where they can feed on new growth. These areas are virtual supermarkets for wolves.

"But wolf predation isn't the issue in the Nimpkish," Janz argues. "What's at issue are the trees that take 200 to 300 years to grow. This old growth can support higher deer populations over the centuries. Wolves are a short-term problem that can be solved through wolf management."

Knut Atkinson's trailer sits just outside Cantor's Woss camp in the Nimpkish Valley. An environment ministry researcher who specializes in predators, Atkinson has set up an experiment to see if deer populations recover when wolves are removed from a given area.

To do this he has set up a trapline in a major watershed. Should he find a wolf trapped inside the specified study area, he'll shoot it. A wolf trapped in an adjacent study area will be released after it is fitted with a collar that sends out radio signals. By tracking the wolves wearing these collars, he hopes to discover whether wolves from neighbouring areas will move into an area where the resident wolves have been killed to protect deer. The experiment is still in its early stages.

RESEARCH TO THE RESCUE?

Once the decision has been made on how much old growth timber to preserve, will that limit forever the number of deer and elk that can be produced on Vancouver Island? Not necessarily, not if land managers succeed in creating deer and elk habitat in managed forests. Looking at this possibility is the task of another program run jointly by the Ministry of Forests and the Ministry of Environment. Called Integrated Wildlife-Intensive Forestry Research (IWIFR), this collection of research projects is attempting to learn more about the interactions between the island's intensively managed young forests and deer and elk.

December is unseasonably warm on the Nanaimo River the day Don Doyle, Rick Davies and Byron Mason check their radio research equipment. Doyle clamps headphones over his ears, points a pronged antenna across the valley, and adjusts the frequency on a boxed receiver slung over his shoulder. The previous winter these IWIFR staff members captured some 21 deer, fitted them with radio collars, and turned them loose. Now the researchers are ready for the real work of tracking the deer for the next two years.

"Once the deer come down to their winter range, we want to find out what use they will make of the second growth," Rick Davies explains.

Some of the life secrets of deer are known. They evidently adapt much less easily to logged areas than was believed. Although a clearcut offers spring forage, once the forest grows and its canopy closes, a young forest becomes a virtual food desert.

But there is still much that isn't known, especially their winter habits. Will deer always make for the shelter of the old forest after a heavy snow, or can they survive the winter in a younger forest? Finding out where the deer go, and why, is exactly what the Nanaimo River study is trying to do.

Cantor forester Julius Kapitany on the left and Fish and Wildlife technician Ken Biond discuss the relative merits of logging all the old growth Nimpkish Valley timber, or preserving a portion of it for deer winter habitat.

Scattered throughout Vancouver Island are small, experimental plots of timber designed to reveal how different forest types respond to different forms of intensive forest management. These plots are shrines of forest management in B.C., where the future lies in coaxing the most wood out of the growing forest. To Brian Nyberg, research plots such as these represent the likely future of wildlife management: growing wildlife among the trees.

"I'm not convinced the deer can't get along without old growth winter range," says Nyberg, wildlife habitat ecologist with the forest ministry's Vancouver forest region. Last summer he and his staff examined more than 80 research plots, studying many combinations of thinning and fertilizing to find where ground vegetation, and hence wildlife forage, can grow best.

But he's still a long way away from actually producing deer winter range. "That would take much more intensive management of small timber blocks than anything we do now," Nyberg notes. "We would try to imitate some of the characteristics of old growth deer winter ranges, especially having large trees interspersed with thickets of small ones. Through extensive thinning, we may be able to produce suitably large, heavily crowned trees in 80 years or less."

All of this is still hypothetical, however, and IWIFR has a five-year time limit to unlock the door to making young forests good deer and elk habitat.

Rick Ellis, the forest ministry's manager of wildlife habitat research, emphasizes the cooperative nature of IWIFR. "There are no easy decisions when it comes to resource management, but we're working towards joint solutions. The forest ministry is committed to integrated use and cooperative research is one step closer to a provincial policy of integrated resource management."

(Left) Fish and Wildlife biologist Doug Janz in the left foreground and conservation officer Dan Lay play a tape recording of a dying deer. They hope to attract wolves fitted with radio collars so the wolves can be monitored by trapper Gordon Boyd and wolf researcher Knut Atkinson. (Bottom) Atkinson, about to apply a radio collar on a trapped wolf, is trying to discover if wolves from neighbouring areas will move into a region where resident wolves are being killed to protect deer.

But will forest managers ever really succeed in growing both trees and wildlife together? Bryan Nyberg thinks so. "Provided we recognize that no single form of forest management and no one type of forest stand is good for all wildlife, and provided there's a continued commitment between wildlife and forest managers to work together."

While there are high hopes for the IWFR studies, conservationists and wildlife managers still stress the importance of preserving old growth habitat like that found in the Nimpkish Valley. "We are just starting to investigate second growth management as it applies to wildlife," notes Don Charlton of the B.C. Wildlife Federation. "We don't know to what extent second growth manipulation can supplement or minimize the need for old growth timber. It would be very short-sighted to destroy our options before we even know what they are."

People

Bryan Couture

by Liz Pope

His life revolves around loggers' sports, and the annual highlight is his hometown Squamish Days festival which he has helped promote into the largest loggers' show in North America. Running from July 28 to August 1, the event attracts 160 competitors and 10,000 spectators.

The spectators feel the tension building as two loggers line up opposite a pair of red and white targets and concentrate on slinging their axe blades into the four-inch bull's eyes over six metres away (20 feet). They are allowed one practice throw, the next three count for points. Bryan Couture aims his polished chrome blade and swings: it strikes just millimetres outside the bull's eye. Couture moves his husky five foot, eleven inch frame over to the target and grabs the axe. "I know what's wrong," he says, turning the blade sideways and examining his reflection. "One of my hairs is out of place."

That is just 35-year-old Couture's way of "stirring things up," a brand of crowd entertaining and competition unnerving he borrowed from loggers in Australia and is installing into loggers' sports shows throughout B.C. To Couture, loggers' sports is not just competition, it is an entertainment field too.

Couture chops, chain saws, runs and hurls through just every logging sports contest except tree climbing. "I'm too heavy for tree climbing," he admits. "You've got to be a bone rack — as I call them — for that."

His muscular build, logging skills and keen enthusiasm have won Couture a respectable collection of Canadian loggers' sports championships, including the double-handed bucking event with Ian Moratti in 1979 and the chokerman's race. The latter contest attempts to name a chokerman's title. Participants, carrying a cable chokers must leap through an obstacle course of logs and a boiling pond, then attach the cable around a log and return to the starting point.

But the championship Couture treasures most is the chain saw

Bryan Couture

chain-carving race. "There is no one that can beat me yet," he says smugly. He can carve a four-legged chair with a chain saw out of a firewood-sized block of alder in 30 to 45 seconds. "In one minute I can do a chair and sit down on it, get up, start the saw, do a stool and sit down on it and put my feet up before the next guy is done."

But Couture has had to work himself back into shape. Last year he was forced into a 12-month retirement from sports and work because of a head-on collision on the infamous Vancouver-to-Squamish highway that left him on a liquid diet while mending leg and facial injuries.

The accident hasn't dampened his enthusiasm for loggers' sports though. After last season's absence he is back on the circuit again, typically travelling to a show every weekend from early May to late September. Couture usually enters 25 competitions a year, sometimes roaming as far as Alberta or California to find them. Winning can be lucrative: with a successful logger reaping up to $1000 a day in prize money.

On the road he drives a motorhome loaded with crosscut saws, cork boots, springboards and fifteen power saws — all on the roof. "I always take extra saws in case someone else doesn't have one," explains Couture. The one he keeps for himself is not your average chain saw. Custom-built by inmates of the Salem, Oregon penitentiary and christened *the eliminator*, it is Couture's ticket to the Hot-Saw event, a power sawing race. The Eliminator's 840cc gas-cat engine enables it to slice through a 24-inch log in five seconds.

Couture's experience with chain saw wizardry is relatively short. "Eleven years ago I had never handled a power saw," he recalls. That changed when he migrated west from Kitchener, Ontario to study logging in Nanaimo. His training resulted in a job near Port Alberni where he worked his way up from setting chokers to hook tending. Then a bout of wanderlust landed him in the South Pacific.

The holiday became a two and a half year visit, much of it spent in Tasmania where he became enraptured with chopping shows, the down under equivalent of loggers' sports. These do not include axe throwing or log rolling but concentrate on log chopping contests instead.

Australians are the best choppers in the world, says Couture. "They are so accurate and they know the wood. They look at the top of the block and look at the grain of it. They chip a piece out of it and taste it, they cut it with their jackknife. Then they'll say 'It'll take me 22 hits to get through that,' and they're right. They are losers down there, real sly foxes."

With chopping in his blood Couture returned to log on Vancouver Island. But he visited Owen Carney in Squamish, and ended up working for him from then on. Couture says Carney, who owns Squamish Shake and Shingle, has won every Canadian championship in logging sports there is to win.

Squamish is a quiet community of 13,000 nuzzling the base of rugged Mt. Garibaldi at the head of Howe Sound. The nearby slopes are covered in coastal timber, providing a forestry livelihood for many of the town's inhabitants. Couture tells what it is like to be a logging sports enthusiast living in Squamish and to not get involved in the Squamish Days festival: it can't be done.

He began by setting up the sports grounds for the loggers' sports events, but soon was adding his own innovations. These include a spike-jaw clamp he designed that quickly secures chopping blocks to their posts, saving a lot of laborious nailing. And competitors at the Squamish show need no longer hew their blocks to regulation size. Couture trims them on his lathe before the show.

Couture's involvement with the festival grew until now, as a promoter, "I work on it all year round." Being a director in both the B.C. Festival Association and the Northwest Festival Association requires that he travel, mostly on his own time and money, to other festivals and conventions where he promotes his own gala and learns from others.

To promote Couture entertains. "I went to the first festival convention in Olympia four years ago and just took them," says Couture, even though he buzzes 800 to 1000 bark-trimmed chairs a year, most in front of an audience. When not in a hurry, he sculpts bears in various poses, also with a chainsaw.

"The chair is done all upside down and backwards so you don't know what it is until you turn it up," he explains. The last cut is the seat. "When that is done I shut the saw off, I grab the leg, turn it upside down and there it is." To finish them off, the chairs, which are sturdy enough to hold Couture but are perfectly sized for six-year-olds, are branded with a hot iron engraving that reads "Squamish Days."

Couture's own travelling logging sports show is another vehicle for promoting Squamish Days. He and ten loggers, calling themselves *The Squamish Lumberjacks*, stage a mock competition of axe throwing, underhand chops, tree climbing and chair carving in front of tourists or conventioneers. Their theatre ranges from the banquet rooms of Vancouver's finer hotels to the Squamish logging sports grounds. If the show is outdoors, a convention official opens proceedings by blasting the top off a tree. "We start off our shows with a bang," quips Couture.

Couture dreams of someday turning logging shows into a full-time business. Although now, "I'm not out to make a lot of money," he says. "I'm out there to promote." Each season he squeezes half a dozen shows around his job as yard foreman at Squamish Stump and Shingle.

"I'd love to work out in the woods," Couture muses. But organizing logging shows and cultivating Squamish Days has taken him away from logging to a job near a phone and close to town.

Couture's promoting is causing Squamish Days to blossom. New sports grounds with a seating capacity of 10,000 and computerized timing of races will be ready for this year's show. Profits from the show and carved chair sales are given to Squamish service clubs.

Couture's reasons for being a volunteer powerhouse for Squamish Days are simple. "I just do it because I like doing it," he says. Response from the townsfolk "just confirms in my mind that I've got to keep doing it."

twirling competition

pole climbing event

those little chairs that I carve. I was the hit of the place," he recalls. To the next convention he brought his chain saw and some blocks of alder. "Well that was it," he grins. "I had contracts coming out of my ears."

"I never get bored of making

by Enid [illegible]

Flying Dragons

wingspan of only 200 cm (8 inches), it predates the French fossil by 10 to 20 million years. In the same mine another fossil was found with a wingspan of 50 cm (20 inches), making it the largest dragonfly ever to fly over Britain.

Today there are some 6,000 species of dragonflies worldwide, with 80 species in British Columbia. Many of the tropical species are as colourful as butterflies, with their wings glowing in the sun like stained glass windows.

Dragonflies and damselflies belong to the insect order *Odonata*, which comes from the Greek word *odon*, meaning "tooth," and refers to the ferocious jaws of these insects. The odonates are divided into two suborders; *Anisoptera*, meaning "unequal-winged", which includes the dragonflies, and *Zygoptera*, which means "yoke-winged" and includes the damselflies.

To distinguish between a damselfly and a dragonfly, observe the position of their wings. The dragonfly rests with its wings extended out from its body, while the damselfly rests its wings folded over its back like a "yoke."

Woodland ponds seem such tranquil places, but beneath the surface of the water is a continual fight for life between predator and prey. Although dragonfly and damselfly

damselflies mating

eggs are eaten by many creatures, odonate larvae are themselves ferocious predators. They capture their prey of tadpoles, mosquito larvae, fish fry and other small animals with their labium, a "lower lip" that is enlarged and armed with hooks. When the labium is not in use it forms a mask that covers part of the larva's face. When a potential victim comes within reach, the labium shoots out, the hooks catch the prey, and the labium deposits the food into the waiting jaws. Hence they have gained the name of "fresh water sharks".

Philip C. Calvert, an authority on dragonflies, notes that a single larva which he kept in an aquarium ate more than 3,000 mosquito larvae plus other insects in just under a year.

The brown or greenish larvae have a certain resemblance to overgrown earwigs. Climbing amongst the aquatic vegetation or clinging to sunken logs or stumps, they blend with their habitat of silt or mud. If alarmed, larvae expel water from their guts in sudden jets which drive them forward like miniature rockets.

Because of their aquatic existence, the larvae need gills to extract the oxygen from the water. In the dragonfly the gills are located within the body at the lower end of the food canal. The larvae of the damselfly have external gills. By moving these featherlike gills from side to side they can also propel themselves along.

When a larva is ready to change into an adult, it crawls up a plant stem or semi-submerged stump to await the moment when a split develops down its back. When that happens, out crawls the adult. It is

Japanese vase with dragonfly

helpless at first as its wings are crumpled, so it rests until they become firm and ready for flight.

Odonates have many enemies. For example, the eggs are parasitized by minute wasps known as "fairy-flies," so small as to be almost invisible. These tiny wasps swim through the water using their microscopic wings like oars, find the dragonfly eggs, and insert one of their eggs into the host's egg. When the wasp larva hatches it devours the contents of the dragonfly or damselfly egg.

Water birds eat many larvae, as do frogs, toads and fish. The winged adults are eaten by many birds that fly near the water's edge. The eastern kingbird, for example, sits on a suitable perch to swoop down on its prey. But the primary destroyer is probably the weather. Long periods of cold rain and heavy winds injure the wings of odonates without the full use of their wings the insects die.

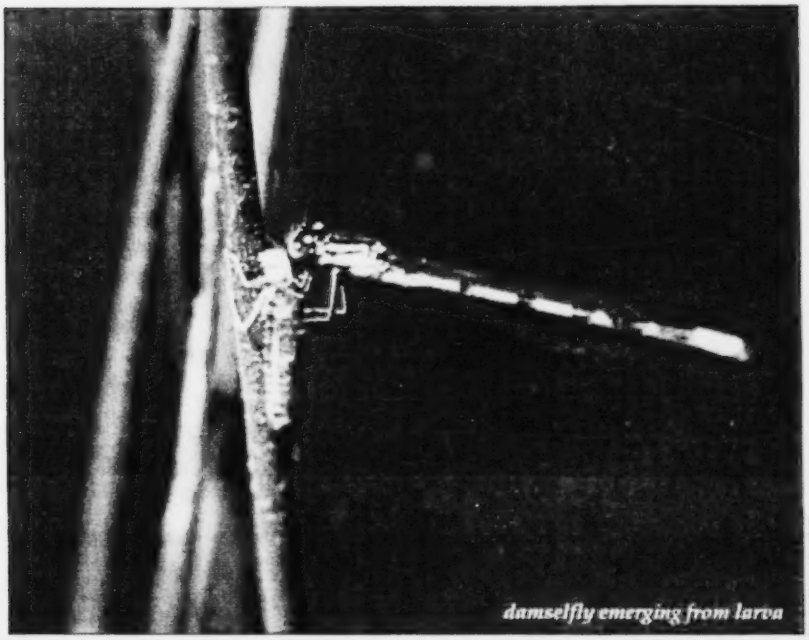
From the moment the dragonfly or damselfly takes to the air until the end of its life, it will be on the wing. It catches prey, mates and even lays eggs during flight. To snag its prey, which consists mainly of flies, wasps, adult mosquitoes and other flying insects, it forms a basket or net with its spiny legs and scoops them out of the air.

Given that dragonflies and damselflies eat vast quantities of mosquito larvae, and that mature odonates eat great numbers of adult mosquitos, it isn't difficult to see why their habitats, such as ponds and marshes, should be protected. They are among man's most beneficial insects.

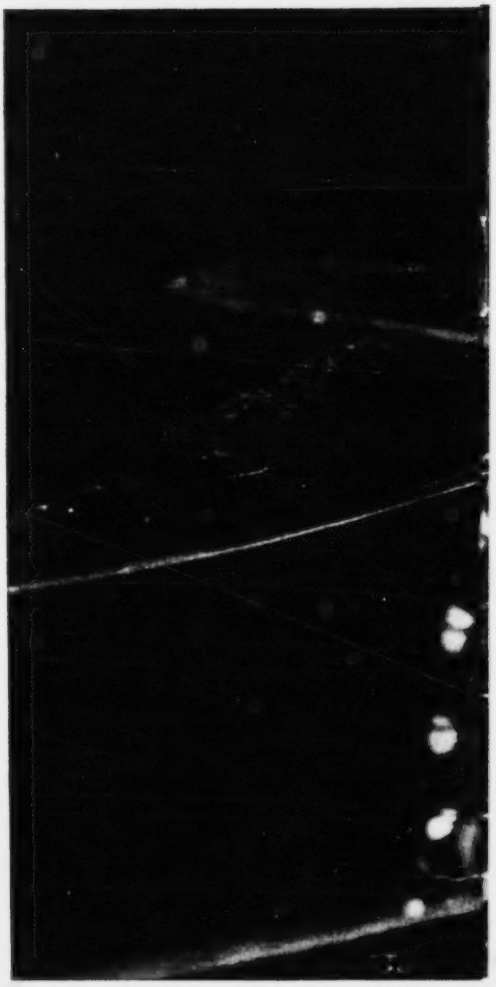
The transparent dragonfly wings that look so fragile are in fact quite strong because of the network of bracing veins that give them strength. As a result, the largest species of dragonflies are among the most powerful fliers in the insect world.

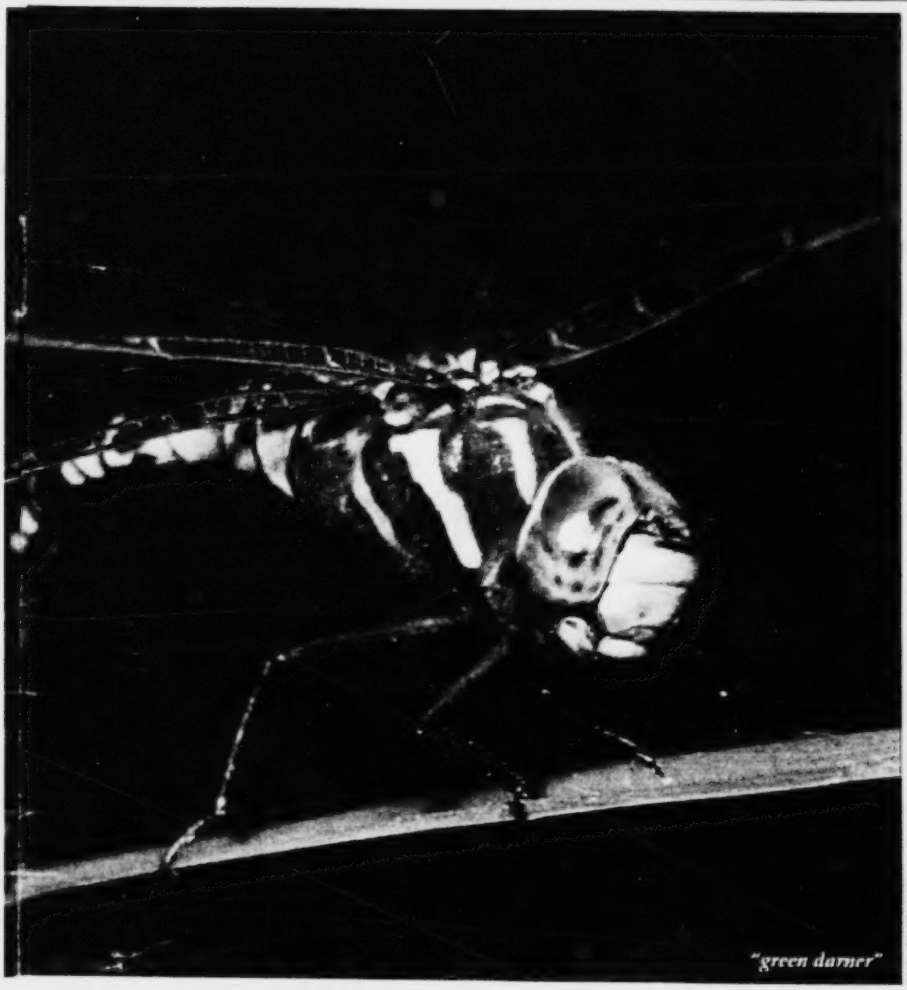
Dragonflies and damselflies have excellent vision. They spot their prey with huge eyes which contain up to 30,000 individual facets, each with its own separate view. The larger facets on the upper surface of the eye are for spotting their victim at a distance, while the smaller ones on the lower portion of the eye are for maneuvering at close quarters.

When ready to mate, odonate males stake out a territory and drive off other males of the same species. Before mating takes place, the male transfers his sperm from the tip of his abdomen to a special pouch just behind his thorax. When he captures a female, she brings the tip of her abdomen forward, the sperm is transferred to



damselfly emerging from larva





"green darner"

that dragonflies could somehow sew up people's lips. The names "snake doctor" and "snake feeder" were based on the superstition that dragonflies would attack the reptile in question. And "horse stingers" referred to the notion that these insects were able to sting horses. The term "mosquito hawk" is quite appropriate, however, because of the enormous numbers of mosquitoes eaten by dragonflies and damselflies.

dragonfly eating a bumble

the female, and the eggs are fertilized. Some species then drop to the water in tandem to allow the female to lay her eggs.

All damselflies and some dragonflies are able to cut holes in vegetation in order to lay their eggs in plant tissue. Thus the eggs are protected from predators, from drying out, or from freezing.

Both eggs and larvae have various survival techniques. The eggs, for example, will delay hatching if they face drought or frost. The larvae, although ready to emerge, can undergo a "diapause," or developmental delay, until the temperature outside reaches a suitable level.

In folklore, these beneficial insects have been given a number of uncomplimentary names. One such name, "devil's darning needle," was inspired by the belief

The aesthetic beauty of dragonflies has been appreciated more in the Far East than in the western world. About 700 years ago, near the close of the Sung Dynasty of medieval China, there lived a master painter and naturalist by the name of Ch'ien Hsuan who is believed to be one of the first artists ever to paint dragonflies. He created a fascinating masterpiece of entomological art showing the predatory behaviour of these insects.

In Japan, the dragonfly is a symbol of victory. It is often to be found on Japanese decorative porcelain and in Japanese literature.

The occidental world hasn't completely ignored dragonflies and damselflies, however. Alfred Tennyson called them "living flashes of light", surely a perfect description for these members of the insect world who add so much beauty to a woodland pond.

BC

Ministry of Forests
Honourable Tom Waterland, Minister

WESTERN YEW

In the dark forest depths beneath the canopies of western hemlock, western red cedar and Sitka spruce thrives a stunted, twisted conifer called the western yew. Like a hermit, this tree prefers a solitary existence, usually staying out of sight of other yew and never dominating a forest stand. Yet it can be found throughout the Kootenays and in coastal forests as far north as the Alaska panhandle.

Yew is a conifer without cones. Each seed is wingless and is packaged singly inside a fleshy, scarlet seed cover, or aril. This colourful covering attracts birds that consume the edible aril but drop the poisonous seed it contains. While most conifers disseminate showers of seed released with a gust of wind, yew seeds are deposited one by one throughout the forest by passing birds.

Yew's scarcity, small size (it rarely grows over nine metres high or 30 centimetres in diameter), slow growth rate and contorted knotty form make it unsuitable for commercial lumber; yet its creamy yellow sapwood and rich auburn heartwood possess exceptional properties that are highly prized by both bow and musical instrument makers.

Archers value yew wood for its remarkable supple, springy nature, and musicians like the complex resonant sound yew produces when crafted into a lute. But because the only yew wood suitable for bows and lutes comes from rare, straight-stemmed, one-hundred-year-old veterans growing on sheltered mountain ridges in the Kootenays, it is difficult material for craftspeople to get their hands on.